



Designing Kitchen Drainage

in Food Service Establishments





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Introduction: The Importance of Kitchen Drainage Design

Through the processes of food preparation, cooking and washing, commercial kitchens can become hotbeds of fats, oils and grease (FOG). FOG accumulates in the wastewater and enters the drainage system without appropriate management – wherein serious problems lie.

Allowing the build-up of FOG in kitchen drainage systems inevitably leads to reduced hydraulic capacity and blockages within the pipes. As a result, food service establishments (FSEs) become vulnerable to cross-contamination, foul odours and flooding. These issues directly compromise hygiene as well as health and safety standards, leaving commercial kitchens at risk of prosecution and forced closure under the jurisdiction of local authorities.

Not only does FOG give rise to a host of issues for FSEs, it also impacts on the wider sewage network. Every year, water and sewage companies (WaSCs) spend millions of pounds removing hundreds of thousands of congealed masses of grease and fats known as ‘fatbergs’ from the UK’s public sewer network.¹ Inevitably, WaSCs have begun to turn their attention to the perpetrators to crack down on drainage malpractice and keep sewers unobstructed. FSEs are increasingly being handed fines for dispensing FOG into their kitchen drainage systems and causing blockages, with penalties increasing in severity to reach a record sum of £180,000 in one particular instance.²

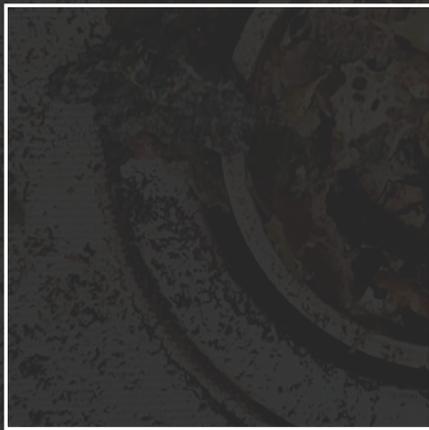
In light of the legal and financial risks, the onus is clearly on commercial kitchens to start implementing drainage systems that dispose of FOG appropriately. In September 2021, ACO Building Drainage surveyed

500

owners and managers of FSEs to gain further insight into the situation. The research seeks to understand whether commercial kitchens are aware of the importance of grease management, and if steps are being taken to ensure effective drainage.

¹ <https://www.bbc.co.uk/news/uk-england-london-56124639>

² <https://www.oxfordmail.co.uk/news/17665922.fine-lady-bakeries-banbury-fined-180-000-illegal-waste-disposal-thames-water-investigation/>



WHAT IS FOG?

FOG STANDS FOR THE DIFFERENT FATS, OILS AND GREASE THAT ACCUMULATE IN THE WASTEWATER OF COMMERCIAL FOOD SERVICE KITCHENS. IT'S CREATED WHEN FOOD IS PREPARED AND COOKED, AND REACHES A KITCHEN'S DRAINAGE SYSTEM WHEN PROCESSING EQUIPMENT, UTENSILS AND CROCKERY ARE WASHED. SINKS, DISHWASHERS, COOKING FACILITIES AND FOOD WASTE ALL CONTRIBUTE TO KITCHEN WASTEWATER, OFTEN CONTAINING FOG THAT HAS NOT BEEN TREATED PROPERLY.

I. Survey Findings

Results from the survey revealed that FSEs are indeed realising the threat posed to their business from the build-up of FOG. An overwhelming majority (87%) of respondents were in agreement that Covid-19 and lockdown have made it more important to avoid unexpected closure caused by controllable circumstances, such as blocked pipes and unsafe workplaces. This is understandable considering the more vulnerable position of businesses in the aftermath of the pandemic, with the UK hospitality sector still experiencing around 25% less turnover than 2019 levels.³

Taking this into account, it's evident that FSEs are determined to reduce the risks of trade disruption and financial penalties. Correspondingly, ACO's survey also found that

90% of commercial kitchen owners and managers recognise their obligation to dispose of FOG appropriately.

Businesses are clearly aware of the dangers presented by improper kitchen drainage and their responsibility to manage grease.

Despite the findings, there continues to be an absence of effective grease management. Figures showed that

56% of FSEs have experienced a build-up of grease in the kitchen and

47% have experienced blocked pipes caused by grease.

From these statistics, it's clear that the accumulation of FOG is still a prevalent issue among FSEs. But more importantly, it confirms that in many cases, commercial kitchens have poorly implemented grease management systems or even lack a system entirely.

To remedy the situation, businesses must understand how their kitchens can be designed to have effective means of drainage in place and avoid the consequences of accumulating FOG.

³ <https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/articles/coronavirusanditsimpactonukhospitality/january2020tojune2021#state-of-the-hospitality-sector>

II. Design Aspects

To implement a drainage system that will perform optimally, it's important to adopt a case-by-case approach. Every kitchen is different and needs to be individually assessed for FOG management. Therefore, several design factors will need to be considered.

Kitchen activity

The style of menu, cooking methods and cleaning activities will all affect the type and amount of FOG waste created in a commercial kitchen. In conjunction, all equipment used in food preparation, cooking and washing should be assessed. Bratt pans and tilt kettles are likely to produce significant levels of FOG from cooking, while dishwashers have the potential to allow food debris and other matter to enter the drain. The length of trading hours and the number of meals served will also affect how much waste FOG is produced. This must be taken into account when specifying the volume capacity for grease management and drainage systems.

Kitchen layout

The space available will impact on what FOG management solutions are suitable. It's likely that smaller establishments will be unable to fit large grease units within the kitchen and may need to install the system outside or position a small, under-sink model. Access to equipment for maintenance, repair and inspection must also be considered in line with spatial capacity.

Sewer connection

Identifying and connecting drainage equipment to the correct sewer is crucial. All wastewater from FSEs must be discharged into the foul sewer to comply with environmental regulations. The use of surface water sewers is not permitted without consent from the local authority via an environmental permit.

Drainage

The drainage system should be reviewed, along with its route through the kitchen and beyond the premises. Correctly sized pipework is essential to maintaining flow rates through FOG management equipment while in operation. Incorrect sizing can lead to blockages and operational issues that could reduce the equipment's ability to stop FOG from entering the drainage system. The fall of pipework must also be appropriate to achieve the required flow rates.

Further guidance for drainage design

While expert advice will be paramount for observing these key considerations, the BS EN 1825-2 standard may also be referred to for general guidance on sizing and installation. The document offers a starting point that outlines the fundamental principles for approaching design and specification.

III. Solutions

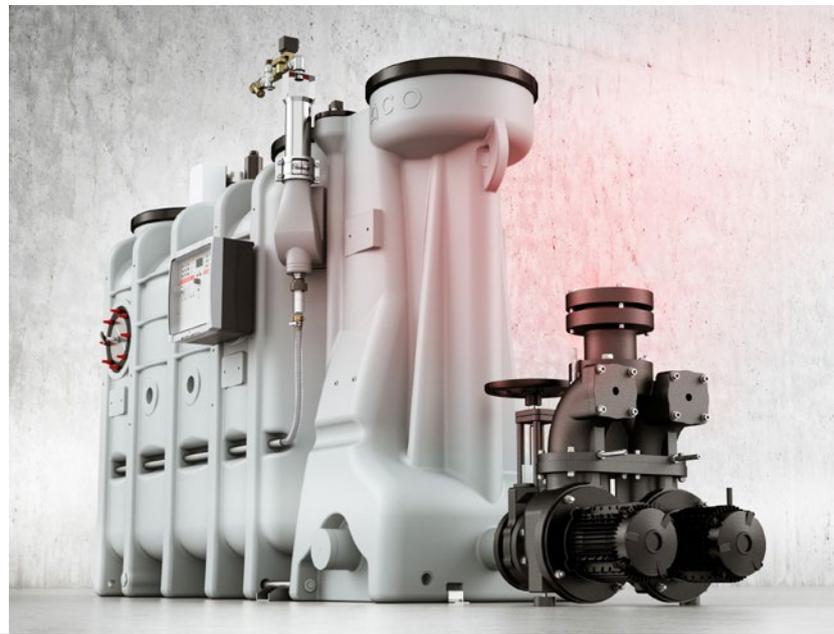
FSEs should assess available solutions in line with the considerations above. Selecting appropriate products will allow commercial kitchens to meet not just the demands of FOG management, but also hygiene and health and safety standards.

Grease management systems

Integral to kitchen drainage design, grease units work to ensure hazardous liquids and solids are removed from wastewater before it enters the public sewerage network. Options include grease separators, grease traps and grease removal units.

Grease separators

Using gravity to separate FOG and food debris from wastewater, grease separators treat discharge from large equipment sources such as sinks and combi ovens. The unit works by slowing down the flow of wastewater to allow for FOG separation before entering the drain. Separators may also contain a filter basket for removing solids in the wastewater.



Grease trap

Grease traps tend to be compact with limited capacity and are mainly sited under sinks. The unit slows and cools the wastewater to separate the FOG. Due to their small size, daily maintenance is required to operate effectively.

Grease removal unit (GRU)

GRUs are a different type of grease separator that removes FOG from wastewater into separate collection containers for disposal elsewhere. As smaller, standalone units, their size makes them suitable for kitchens with limited space and access. GRUs can be used to manage the discharge from equipment or appliances that may dispense large volumes of FOG waste.



Drainage components

Along with a grease management system, drainage equipment will also need to be factored in for a comprehensive solution. An effective kitchen drainage design should include debris baskets, foul air traps, and gullies or channels with gratings.



Debris filters

In commercial kitchen environments, there will be moments where food debris falls onto the floor and accumulates in gullies as part of surface runoff. To prevent this matter from entering the drain, FSEs should have sieves or silt baskets installed in gullies for collecting food particles from the wastewater.

Foul air traps (FATs)

FATs prevent foul odours from wastewater developing in the kitchen or escaping through the pipework into external surroundings. These can already be integrated as part of a gully's design or implemented as a separate component.



Gullies and channels

Gullies and channels should be used for facilitating surface water removal, wastewater drainage and transport to a grease unit. As well as central siting in a kitchen, these can be strategically placed near to equipment and appliances to manage sources of outflow. Gullies and channels will need to be specified by load class and flow rate respectively, to sustain traffic and discharge in the area.

Slip-resistant gratings should also be installed to minimise the risk of slips and falls. These will need to be easily removable for maintenance, but likewise allow for racks and trolleys to travel over them without displacement.

How hygienic performance can be maintained

Regular maintenance of drainage systems plays a critical role in ensuring hygiene and health and safety standards are consistently met. ACO's HygieneFirst range of drainage solutions are designed with such requirements in mind for optimum kitchen performance.

All products designed according to the HygieneFirst philosophy comply with the food industry design guidelines 'Hazard Analysis Critical Control Point' (HACCP), which advocates amongst other design features that an internal radius should be equal to or larger than 3 mm.

HygieneFirst products are manufactured from smooth stainless steel, and in combination with the implemented HACCP guidelines, enhances cleanability. This limits the build-up of bacteria, making it easier to remove any further residue. Smooth contouring is implemented in every design to remove sharp-corner hazards and ensure FOG waste doesn't accumulate in crevices. Commercial kitchens can therefore benefit from a higher standard of safety and greater ease of maintenance.

Conclusion

The results from ACO's survey have revealed the absence of appropriate drainage systems in commercial kitchens. The majority of FSEs clearly understand their obligation to manage FOG waste – especially in the current trade climate as businesses find themselves more vulnerable to financial ramifications. Yet, even with the importance of best practice being recognised, FSEs continue to experience FOG build-up and blockages.

To manage grease successfully, businesses will need to apply effective kitchen design with the help of professional advice and guidance. Making the right choices and specifications allows FSEs to maximise their hygiene standards in daily operations.

FOG should not be an afterthought but instead an active part of running a modern kitchen.

For more information, get in touch with the ACO team today at **UK-Grease@aco.co.uk** or phone **01462 810424**. They can provide expert guidance and suggest the right grease management system for your clients' kitchens.

